***Species at Risk Act***
Recovery Strategy Series

# Recovery strategy for the Harbour Seal, Lacs des Loups Marins subspecies (*Phoca vitulina mellonae*)

## Harbour Seal, Lacs des Loups Marins subspecies

2018

Canada

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For copies of the recovery strategy, or for additional information on species at risk, including COSEWIC Status Reports, residence descriptions, action plans, and other related recovery documents, please visit the SAR Public Registry[1].

**Cover illustration**: **François Martin, Nunavik Research Center, Makivik**

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[1] http://www.registrelep.gc.ca/

# PREFACE

The federal, provincial, and territorial government signatories under the Accord for the Protection of Species at Risk (1996) agreed to establish complementary legislation and programs that provide for effective protection of species at risk throughout Canada. Under the *Species at Risk Act* (S.C. 2002, c.29) (SARA), the competent federal ministers are responsible for the preparation of recovery strategies for listed extirpated, endangered, and threatened species and are required to report on progress five years after the publication of the final document on the SAR Public Registry.

The Minister of Fisheries and Oceans is the competent minister for the Lacs des Loups Marins Harbour Seal and has prepared this strategy, as per section 37 of SARA. It has been prepared in cooperation with the Cree Nation Government, the Cree Trappers Association, the Makivik Corporation, the Kativik Regional Government (Tursujuq National Park), Hydro-Québec (present until June 2011), and the Ministère des Forêts, de la Faune et des Parcs du Québec.

Success in the recovery of this subspecies depends on the commitment and cooperation of many different constituencies that will be involved in implementing the directions set out in this strategy and will not be achieved by Fisheries and Oceans Canada, or any other jurisdiction alone. All Canadians are invited to join in supporting and implementing this strategy for the benefit of the Lacs des Loups Marins Harbour Seal and Canadian society as a whole.

This recovery strategy will be followed by one or more action plans that will provide information on recovery measures to be taken by Fisheries and Oceans Canada and other jurisdictions or organizations involved in the conservation of the species.

# ACKNOWLEDGMENTS

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# EXECUTIVE SUMMARY

The Harbour Seal of the Lacs des Loups Marins (*Phoca vitulina mellonae*) is a subspecies of the Harbour Seal living exclusively in freshwater. This population is unique worldwide because its distribution range is entirely within Quebec and even there is quite limited, extending only throughout a chain of lakes and rivers in Nunavik, some 250 km east of Hudson Bay. Researchers estimate that the Lacs des Loups Marins Harbour Seal population was isolated from its original marine habitat between 3,000 and 8,000 years ago. Estimates of current population size contain a high margin of error and range from 50 and 600 individuals.

Though the Lacs des Loups Marins Harbour Seal population has always been small, it may have been further diminished in the past through hunting. Presently, one of the main potential threats to its survival, identified in the status report of the Committee on the Status of Endangered Wildlife in Canada (COSEWIC), is the development of hydroelectric dams that could cause the disappearance of areas of open water during the winter months and mercury contamination in fish. However, since July 2013, the Tursujuq National Park protects the territory from such development.

Climate change is now likely the main threat because this seal population may have difficulty adapting to a modified environment. Anthropogenic disturbances associated with the tourism industry, scientific research, and mining exploration and development may also become contributing factors in this population's decline. Aboriginal hunters may occasionally and opportunistically harvest a few individuals, but this population is not currently the target of a traditional hunt. Given the small size of the population, these threats could result in its disappearance.

The Lacs des Loups Marins population of Harbour Seals was designated as "endangered" by COSEWIC in November 2007. The population objectives of this recovery strategy are to reach a total population of 210 individuals within 25 years and 250 mature individuals over a longer term. Given the level of uncertainty concerning the present population size, its distribution range and the biology of the species, these objectives may change as new knowledge on the seal and its habitat is acquired.

To further the efforts already undertaken, the present document puts forward a strategy to guide the measures required to prevent the disappearance of this subspecies endemic to Canada. Increasing knowledge about this population and protecting its habitat are the proposed strategies with the highest priority. The lakes where the presence of freshwater seals has been confirmed – Lake Bourdel, Lacs des Loups Marins and Petit lac des Loups Marins – are identified as critical habitat.

# RECOVERY FEASIBILITY SUMMARY

The recovery of the Lacs des Loups Marins Harbour Seal population is deemed feasible because it meets the four following criteria used to evaluate biological and technical feasibility:

**1. Individuals of the wildlife species that are capable of reproduction are available now or in the foreseeable future to sustain the population or improve its abundance.**
Though no births have ever been observed, many adults, including possibly gestating females, have been seen in the Lacs des Loups Marins region. The Cree and Inuit hunters met during consultations believe that the population size is likely greater than the current estimates.

**2. Sufficient suitable habitat is available to support the species or could be made available through habitat management or restoration.**
Habitats adequate for population growth exist, though our knowledge of these habitats is very limited. According to the little information available, the Lacs des Loups Marins Harbour Seals are spread out over the vast stretches of water of the Lacs des Loups Marins, the Petit lac des Loups Marins and Lake Bourdel. During the public consultations held in the aboriginal communities (2009), some participants suggested that the actual distribution range is in fact more extensive than stated in the COSEWIC status report. Measures are nonetheless required to prevent the degradation or destruction of existing habitat and, especially, to preserve the ice-free areas which, in winter, provide the seals with access to air.

**3. The primary threats to the species or its habitat can be avoided or mitigated.**
Most of the threats can be mitigated with the protection granted by the Tursujuq National Park. Other threats, such as climate change, will have to be monitored to assess their impact.

**4. Recovery techniques exist to achieve the population and distribution objectives or can be expected to be developed within a reasonable timeframe.**
Effective measures for the protection of the habitat of the Lacs des Loups Marins Harbour Seal can be implemented to ensure the population's survival and growth.

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# LIST OF ACRONYMS

| | |
|---|---|
| COSEWIC | Committee on the Status of Endangered Wildlife in Canada |
| CTA | Cree Trappers Association |
| DFO | Fisheries and Oceans Canada |
| HTFCC | Hunting, Fishing and Trapping Coordinating Committee |
| JBNQA | James Bay and Northern Quebec Agreement |
| MFFP | Ministère des Forêts, de la Faune et des Parcs |
| SARA | *Species at Risk Act* |
| SEA | Strategic Environmental Assessment |

# 1. COSEWIC SPECIES ASSESSMENT INFORMATION

Below is the summary of the COSEWIC assessment as it is presented in the status report (COSEWIC, 2007).

**Date of assessment:** November 2007

**Common name:** Harbour Seal, Lacs des Loups Marins subspecies

**Scientific name:** *Phoca vitulina mellonae*

**Status:** Endangered

**Reason for designation:** This land-locked subspecies is endemic to Quebec and may number as few as 100 individuals. It inhabits a small series of lakes in northern Quebec and is the only subspecies to live entirely in fresh water. The population has declined due to hunting and may still be declining. Proposed hydroelectric development would cause pervasive changes to the habitat.

**Occurrence:** Quebec

**Status history according to COSEWIC:** Designated "species of special concern" in April 1996. Status re-examined and designated "endangered" in November 2007. Last assessment based on an updated status report.

# 2. SPECIES STATUS INFORMATION

The Lacs des Loups Marins Harbour Seal (*Phoca vitulina mellonae*) population that lives in the Ungava Peninsula in Quebec is the only existing population of this subspecies. Its entire distribution range is thus confined to Canada. It is ranked "critically imperilled" by NatureServe (Canada and Quebec). The Quebec Government has put the population on the list of species likely to be designated as threatened or vulnerable.

# 3. SPECIES DESCRIPTION

## 3.1 Species Description

The Lacs des Loups Marins Harbour Seal lives exclusively in fresh water. It is, in fact, the only freshwater seal in North America and the only freshwater Harbour Seal subspecies in the world. It is known by the Crees as *achikunipi* and by the Inuit as

*qasigiaq*. Since few studies have been done on this subspecies, specific knowledge about this population is lacking.

The Harbour Seal (*P. vitulina*) is a small pinniped species with a variable pelage colouration of mottled brown, black and yellowish-white. Average length at birth in eastern Canada is approximately 80 cm and does not differ significantly between males and females (Boulva and McLaren, 1979). Male adult Harbour Seals reach a length of about 154 cm compared to about 143 cm for females (Boulva and McLaren, 1979). Mature weight averages 90 kg for adult males, and 70 kg for females (Boulva and McLaren, 1979). In mature females, drastic changes in body condition and weight occur from pupping through lactation. The average lifespan of Harbour Seals appears to be around 30 years (Boulva and McLaren, 1979).

The Lacs des Loups Marins Harbour Seal differs from its closest marine relative (*P. v. concolor*) by its unusually dark pelage, by certain aspects of its morphology, particularly a wider and flat skull, by its behaviour – it lives in fresh water and breeds earlier than other seals – and by its genetic make-up (Smith et al., 1994; Smith, 1999). Aboriginals particularly appreciate the colour of its pelt. The Inuit consider the pelt of the freshwater seal to be darker, softer and glossier than that of the saltwater variety. The Cree of northern Quebec observed that *P. v. mellonae* is smaller and darker than marine Harbour Seals, behaves differently, and has a distinct taste (Atkinson, 1818; Doutt, 1942; Consortium Gilles Shooner & Associés et al., 1991; Posluns, 1993).

## 3.2 Population and Distribution

The first written record of *Phoca vitulina mellonae* was made by Atkinson in 1818. In 1898, Low formulated the hypothesis that the population had been isolated for 3,000 to 8,000 years, trapped by the Ungava peninsula's isostatic[2] rebound since the retreat of the Laurentian ice sheet. It was not until 1942 that Doutt published a scientific description of the subspecies *P. v. mellonae*.

According to the COSEWIC status report, the subspecies is geographically and genetically isolated, and the arrival of migrant Harbour Seals to the Lacs des Loups Marins region is unlikely. In addition, the immigration of marine seals is hampered by the distance from the coast, and the adjacent populations in Hudson Bay and Ungava Bay are relatively small (Mansfield, 1967).

### 3.2.1 Population Size and Trends

There are no reliable estimates of the abundance of Lacs des Loups Marins Harbour Seals because little information is available. Range-wide abundance trends cannot presently be calculated.

[2] Isostatic relates to all movements of the earth's crust caused by the transfer of mass, like the receding of glaciers

Estimates of population size range from 50 to 600 individuals and are most often imprecise, varying from author to author (DFO, 2009). For example, in three years of intensive summer field work at Lacs des Loups Marins, which all evidence indicates is the core of the freshwater seal range, Smith (1999) was able to observe only 39 individuals. A total of 52 seals were observed during a survey of the open water areas in the Lacs des Loups Marins in May 2011 (J.-F. Gosselin, DFO, personal communication). Population trends over time obviously cannot be calculated, even though written records attesting to a wider distribution range and higher capture rates suggest that population abundance was greater in the past (COSEWIC, 2007). It is also possible that this population is naturally small, limited by the carrying capacity of the habitat.

### 3.2.2 Distribution

It is believed that the Harbour Seals of the Lacs des Loups Marins presently occupy at least 670 km² of lakes and rivers in the Ungava Peninsula (Smith et al., 2006 ; Figure 1). Though the known distribution range seems to be limited to the Lacs des Loups Marins, the Petit lac des Loups Marins and Lake Bourdel, traditional aboriginal knowledge and the historical records report a distribution range extending into several lakes and rivers in the Lacs des Loups Marins region, most notably Lake Minto, Wiyâshâkimî lake (formerly called lac à l'Eau Claire) and the Nastapoka River (Flaherty, 1918; Manning, 1946; Berrouard, 1984; Archéotec, 1990; Consortium Gilles Shooner & Associés et al., 1991; Smith, 1999). This information is corroborated by the Cree toponyms in this area which make reference to the presence of seals in specific locations (Archéotec, 1990). Furthermore, during the public consultations held by DFO in the Aboriginal communities in 2009 and 2012, some participants suggested that the distribution range was more extensive than described in the COSEWIC status report and could possibly extend beyond the designated perimeter. According to them, the population could even be on the rise.

There is no data on the seasonal movements of freshwater seals though the most recent observations have established that the seals spend the winter months in larger bodies of water like Lacs des Loups Marins, Lake Bourdel and the Petit lac des Loups Marins, and disperse into outlying, smaller bodies of water when the ice melts (Consortium Gilles Shooner & Associés et al., 1991). It is unlikely that the Lacs des Loups Marins Harbour Seals are able to get past the waterfalls on the Nastapoka River and move between the area of Lacs des Loups Marins and Hudson Bay or into Ungava Bay (Low, 1898; Smith, 1999).

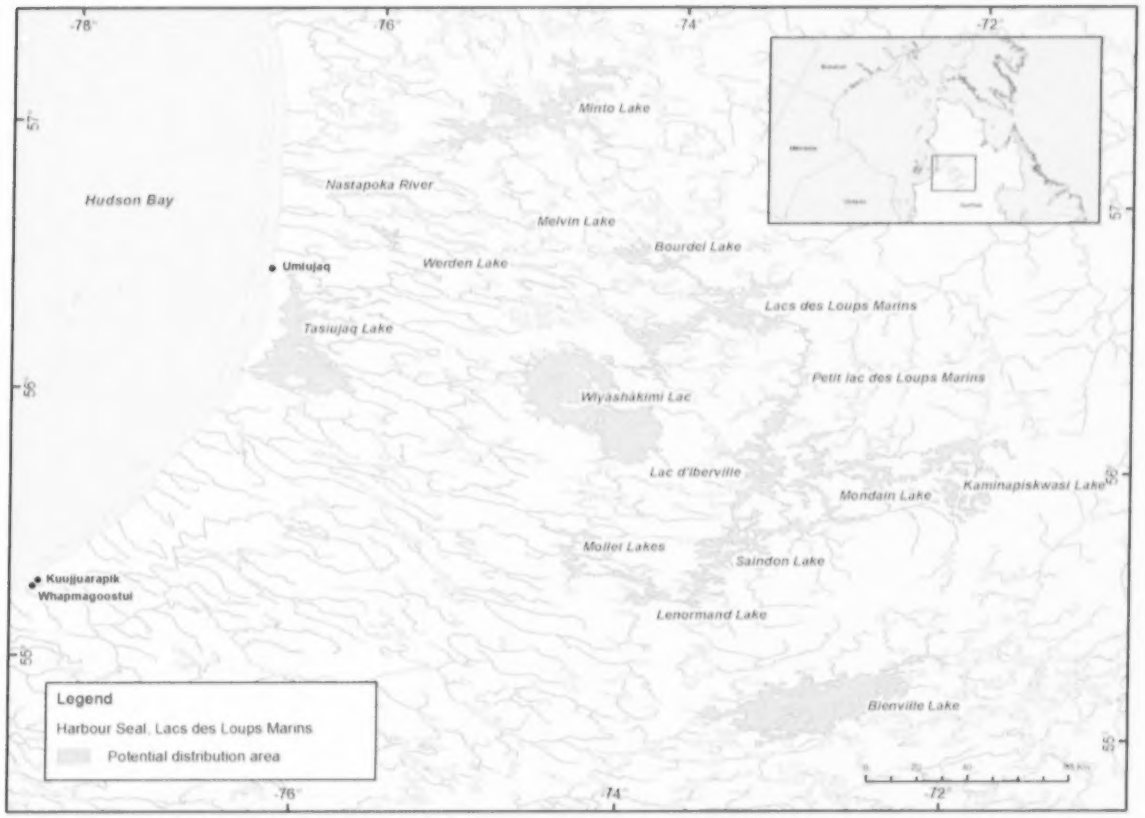


Figure 1. Potential distribution area of the Lacs des Loups Marins Harbour Seal. Data originate from literature and traditional knowledge (Consultations in Whapmagoostui, Kuujjuarapik, Umiujaq, April 3 and 4, 2012).

## 3.3 Needs of the Lacs des Loups Marins Harbour Seal

The Lacs des Loups Marins Harbour Seal feeds primarily on Lake whitefish (*Coregonus clupeaformis*), Lake trout (*Salvelinus namaycush*), Lake herring (*Coregonus. artedii*) and Brook trout (*Salvelinus fontinalis*). Results from both the stable-isotope and fatty acid analyses conducted on different groups of seals, including freshwater seals, confirmed that the diet of the Lacs des Loups Marins Harbour Seals was of freshwater origin (Smith et al., 1996). It is likely that predation by the seals has modified the fish species composition in the Lacs des Loups Marins where Lake trout are less abundant than in the surrounding lakes (Power and Grégoire, 1978; Consortium Gilles Shooner & Associés et al., 1991).

Unfortunately, there are no data on the life history parameters of the Lacs des Loups Marins Harbour Seals. If this Harbour Seal population is similar to their marine counterparts, females reach sexual maturity between 3 and 6 years of age and males between 5 and 6 years. The survival rate of pups is estimated to be low (COSEWIC,

2007; DFO, 2009). It appears that the whelping[3] date of the Lacs des Loups Marins Harbour Seal is very early in the spring (early May), substantially earlier than marine Harbour Seals at similar latitudes that give birth in June (Consortium Gilles Shooner & Associés et al., 1991; Smith et al., 1994). Females seem to have one pup every year when the lakes are still covered with ice. According to the COSEWIC report, several authors have postulated that births takes place in under-ice shelters rather than on the ice, though there have been no direct observations to confirm this.

Tracking from September to November of tagged seals in the Lacs des Loups Marins has indicated that the seals exhibit considerable site fidelity to particular areas along the shores. However, they do at times cover relatively long distances, averaging between 1.5 and 9.8 km per day, and the individual ranges of the seals may vary from 82.9 km² to 890.8 km² (Smith et al., 2006). During the winter, the seals do not move exclusively by water; they also use paths on the ice and snow to move from one open water area to another. In the spring, they expand their territory, moving through adjoining rivers and over land (Consortium Gilles Shooner & Associés et al., 1991; DFO, 2009). Haul-out[4] activity increases in the spring, during pupping, and again in August, most likely during the moult. The seals haul out onto the ice in spring and onto rocks, isolated islands and beaches in the summer.

Harbour Seals, unlike the true arctic seals such as ringed (*Phoca hispida*) and bearded seals, (*Erignathus barbatus*), are not able to maintain breathing holes in the ice during the winter. Because they lack elongated front claws, Harbour Seals cannot excavate holes in the ice. During Arctic winters, they therefore depend on permanent areas of open water in order to surface (Mansfield, 1967; Stewart and Lockhart, 2005).

Three factors appear to contribute to maintaining areas of open water in the ice cover during the winter months: velocity of moving water, water temperature, and decreases in water level due to decreased water input from tributaries that are completely or partially frozen. In winter, when the vast majority of the lakes and rivers are covered with ice, the seals may rely on several physical features for their sources of air: areas that remain ice-free because of strong currents, fissures in the ice, and air pockets created by the shoreline's complicated geometry or by undulations in the bottom of the ice sheet on the lake's surface (Smith and Horonowitsch, 1987; Consortium Gilles Shooner & Associés et al., 1991; Dean Consulting & Research Associates, 1991).

# 4. THREATS

The recovery potential for the Lacs des Loups Marins Harbour Seal is compromised by the small size of the population and the limited distribution range which combine to increase the subspecies' vulnerability.

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[3] Giving birth to pups

[4] Hauling-out is the behaviour of temporarily leaving the water between periods of foraging activity for sites on land or ice.

Climate change is likely the main threat because this seal population may have difficulty adapting to a modified environment. For example, Aboriginal hunters have reported increased predation by bears, which possibly stems from climate change, and which seems already to have had an impact on this population. The possibly significant impact of hydroelectric development on seal habitat could constitute a threat. Other threats include the occasional and opportunistic harvest of individuals through hunting, and disturbances caused by increased tourism, scientific research, and mining activity. To a certain extent, all these factors threaten the survival of this small, unique population.

## 4.1 Threat Assessment

Table 1 presents an assessment of the threats to the recovery of the Lacs des Loups Marins Harbour Seal, classified according to several parameters, especially level of concern. The threats were assessed using the best currently available information. This assessment may change over time and as new knowledge is gained.

Table 1: Classification of threats

| Threat | Extent | Occurrence | Frequency | Causal certainty | Severity | Level of concern |
|---|---|---|---|---|---|---|
| **Climate change** | Widespread | Current | Continuous | Low | Unknown | Moderate |
| **Hydroelectric development** | Widespread | Anticipated | Continuous | High | High | Low |
| **Harvest (occasional and opportunistic hunt)** | Localized | Current | Seasonal | Moderate | Moderate | Low |
| **Tourism** | Widespread | Anticipated | Unknown | Low | Unknown | Low |
| **Mining exploration and development** | Localized | Anticipated | Continuous | Low | Low | Low |
| **Scientific research activity** | Widespread | Imminent | Recurrent | Moderate | Low | Low |

**Extent**: indicates whether the threat is widespread or localized within the total distribution range of the population.
**Occurrence**: indicates whether the threat is historic (has contributed to the population's decline but no longer affects it), current (presently affects the population), imminent (should affect the population in the near future) or anticipated (could affect the population in the future).
**Frequency**: indicates whether the threat occurrence is unique, seasonal, continuous or recurrent (as opposed to annual or seasonal).
**Causal certainty**: indicates whether the quality of the best available information on the threat and its impact on the population's viability is high, moderate or low.
**Severity**: indicates whether the severity level of the threat is high, moderate or low.
**Level of concern**: indicates whether the concern level about threat management, on the whole, is high, moderate or low. This may take into consideration the ability to mitigate or eliminate the threat.

## 4.2 Description of threats

### 4.2.1 Climate Change

Warming trends have numerous effects: milder winters, earlier break-up of the ice cover, an increase in primary production which could have repercussions on wildlife, the displacement of some wildlife species northward, impacts on migratory species, thawing of the permafrost, land subsidence, changes to the hydrologic regime with increases in water temperature in lakes and rivers impacting on regional aquatic wildlife (Bourque and Simonet, 2008). Furthermore, Northern Quebec is the region of the province that will undergo the greatest climate change (Bourque and Simonet, 2008).

The local Aboriginal communities have noticed a gradual change in the composition of the wildlife in their area, potentially caused by climate change. They noticed changes such as increases in the eagle population or in the number of beaver dams. Regarding this seal population, there is, according to them, an increase in the presence of certain predators. This is true of the black bear (*Ursus americanus*) which seems to be extending its distribution range northwards (Consultations, Whapmagoostui, Kuujjuarapik, Umiujaq, 2012). The black bear is an opportunistic predator and may at times attack marine Harbour Seals. Aboriginal people have also noticed that polar bears (*U. maritimus*) are venturing increasingly further inland; it is known that these bears prey heavily on seals. An increase in predation could threaten the survival of the Harbour Seals of the Lacs des Loups Marins, given their present low numbers. The impact of climate change, current and future, is difficult to evaluate. The level of concern of this threat may change as the effects on this northern ecosystem become apparent.

### 4.2.2 Hydroelectric Development

According to COSEWIC, rising fossil fuel energy prices, and concerns regarding air pollution, have prompted a renewed interest in hydroelectric development. The Nastapoka River, whose headwaters are in the Lacs des Loups Marins, has potential for hydroelectric development. The government of Quebec, the Makivik Corporation and the Kativik Regional Government (Tursujuq National Park) are stakeholders in the Sanarrutik Agreement which expressly promotes hydroelectric development on the Nastapoka. However, in July 2013, the Ministère des Forêts, de la Faune et des Parcs created the Tursujuq National Park, which includes almost the entire Nastapoka River basin. The *Parks Act* (R.S.Q., c. P-9) prohibits any utilization, harvesting or harnessing of resources related to the production of energy inside a park. The freshwater seal's habitat is therefore protected from hydroelectric development within the park boundaries. However, hydroelectric development remains a threat because it still possible outside the park, in potential freshwater seal habitat.

It is known that the creation of the vast water reservoirs required by hydroelectric generating stations alters upstream water flows, leading to the disappearance of ice-free areas and under-ice shoreline shelters that are absolutely necessary for the seals during winter (COSEWIC, 2007). Hydroelectric development in the range of the

population may also affect the distribution and abundance of the seals' prey and contaminate the animals with methyl mercury released from the flooded, decomposing vegetation (Woodley et al., 1992). Methyl mercury is known for its immunotoxicity[5] and the damage it does to the central nervous system of mammals (reviewed in Wolfe et al., 1998). In addition to the direct disturbances in the seals' environment, hydroelectric development entails road and transmission line construction which may impact on the species if they are constructed in its habitat. Experience acquired in Finland, on Lake Saimaa, which is inhabited by landlocked ring seals (*Phoca hispida saimensis*), shows that modifications to the physical characteristics of the environment, particularly variations in water level caused by hydroelectric installations, can lead to higher mortality rates in pups (Sipilä and Hyvärinen, 1998).

### 4.2.3 Harvesting (Occasional and Opportunistic)

At present, the only known cause of human-induced mortality in this small seal population is occasional hunting by aboriginal people. Under the terms of the James Bay and Northern Quebec Agreement, the freshwater seals north of the 55th parallel are reserved for the exclusive use of the Cree, the Inuit and the Naskapi. The introduction of hunting with rifles and the surge in interest in seal skins for decorative purposes may, in the past, have led to a reduction of the population in the lakes and rivers in the areas adjacent to the hunting territories (Smith and Horonowitsch, 1987). Cree elders report that the historic hunt is thought to have reached a peak in 1918 (I. Masty, CTA, personal communication). The distance to reach areas where freshwater seals are present is great, but Crees would travel greater distances to hunt caribou in those days. The pelts of these freshwater seals were renowned for their high quality. This hunt is very limited today because the communities' needs and activities have changed. During consultations on whether to add the species to the List of Wildlife Species at Risk, the local population confirmed that occasionally one or two individual seals are killed each year but the species is not the object of a traditional hunt (Consultations, Whapmagoostui, Kuujjuarapik, Umiujaq, 2009). Cree elders suggest that fewer than 10 freshwater seals have been harvested over the past 30 years (I. Masty, CTA, personal communication).

The presumed limited size of the population means that a small increase in the hunt could constitute a threat. It is difficult to predict the behaviour of the next generations of hunters and thus the impact of this threat in the future. Should this area become more accessible, for example with an increase in industrial activities, the impact of this threat could change. The level of uncertainty surrounding the true size of the population (estimates vary from 50 to 600 individuals) warrants a close monitoring of the number of captures to assess the impact of this threat.

[5] Immunotoxicity may be defined as the adverse effects on the functioning of the immune system that result from exposure to chemical substances.

### 4.2.4 Tourism

The tourism sector in Nunavik is expanding rapidly. Increased human presence in the habitat of the Lacs des Loups Marins Harbour Seal may disturb individuals and interfere with the activities essential for their survival.

The Tursujuq National Park of Quebec, which includes most of the Nastapoka River basin, was officially created in July 2013 (Figure 2). Creation of this park could increase tourism in the region, and visitors may be attracted by the observation of a unique and iconic species such as the Lacs des Loups Marins Harbour Seal. Cree and Inuit hunters who were consulted, and who know this seal, believe that it may be easily disturbed by human presence. Disturbance from tourism is one of their concerns. However, most of the range of the Lacs des Loups Marins Harbour Seal is situated in a remote territory, which is costly to access. Access to this territory will not be made easier by the creation of the park because no roads are expected to be built in the sector where freshwater seals are found.

Tourism activity in the seals' territory is presently negligible and, should the number of visitors increase, measures can be implemented by the park's authorities to mitigate disturbance, since the park's main purpose is conservation. For example, sensitive areas inside parks can be protected using a particular zoning such as preservation zones or maximum preservation zones. The park director has the power to control or prohibit access to certain sectors of the park. In addition, the director must authorize research activities. However, these measures are outside of the federal government's control. The level of concern for this threat is considered low.

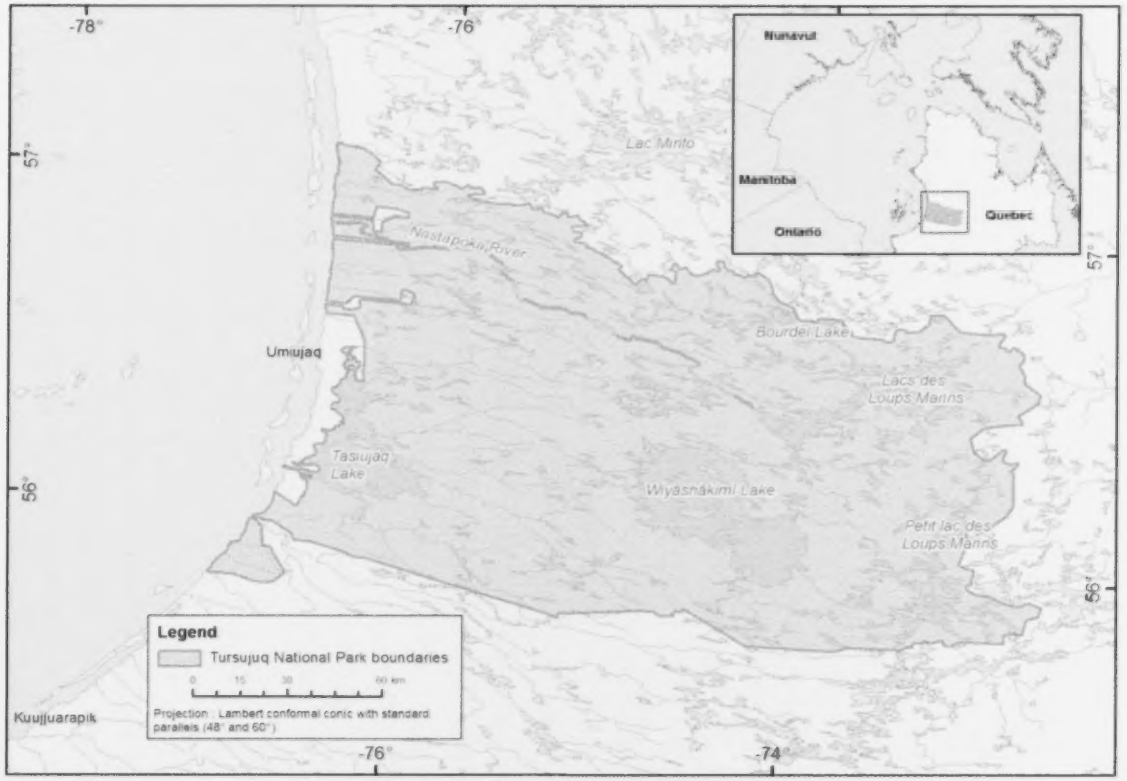



Figure 2: Tursujuq National Park

### 4.2.5 Mining Exploration and Development

Presently, there are no mining operations conducted in the territory of the Lacs des Loups Marins Harbour Seal. Mining exploration and operations are prohibited within Tursujuq National Park. However, future mining development in areas adjacent to the park remains possible. There are active mining claims within the Nastapoka River watershed. The northern part of the watershed is not exempted from mining. Mining development is subject to environmental impact assessments but it could nevertheless affect water quality or change water flows in the region's lakes and streams. This threat has consequently been included in the list of factors that could influence the recovery of the population, even though the level of concern is presently low.

### 4.2.6 Scientific Research Activity

Due to its status as an endangered species and the numerous information gaps concerning this population, the Lacs des Loups Marins Harbour Seal may be the subject of increased scientific research. Though the acquisition of knowledge is essential for the implementation of recovery measures for the freshwater Harbour Seal, these research projects could cause disturbance to individual seals. For example, researchers need to

approach the seals to take photographs required to identify the individuals and also to collect biopsy specimens. Tagging individuals or fitting them with transmitters requires the capture and anaesthetizing of the animals, which induces stress. However, certain measures can be taken to mitigate the effects of scientific research activities on the health of individuals and the recovery of the population. These measures could become conditions for granting scientific permits (permits granted under the *Species at Risk Act* and granted by the Tursujuq National Park). This threat has consequently been included in the list of factors that could influence the recovery of the population, with a low level of concern.

# 5. POPULATION AND DISTRIBUTION OBJECTIVES

It is difficult to determine population and distribution objectives for the Lacs des Loups Marins Harbour Seal, given the lack of precision in both the historical and contemporary data on the population size and the uncertainty concerning the environment's carrying capacity. The Lacs des Loups Marins cover a territory of around 500 km² that could theoretically support a population of around 200 individuals (DFO, 2009). According to the historical data and recent reports by indigenous people, freshwater seals have been observed beyond the chain of lakes which comprise the Lacs des Loups Marins. Sightings have been reported from Lake Bourdel to the Petit lac des Loups Marins, and these lakes may be able to support colonies year round (DFO, 2009), which would extend the area of suitable habitat for the seals to around 750 km². If the fish productivity of this habitat is similar to that of the Lacs des Loups Marins, the carrying capacity of the entire sector may be estimated at 300 individuals.

DFO has taken a precautionary approach to the management of various marine resources, including seals, aimed at maintaining populations at approximately 70% of the maximum population of the environment's carrying capacity (Hammill and Stenson, 2007). Considering that the Lacs des Loups Marins, the Petit lac des Loups Marins and Lake Bourdel can support 300 individuals, the population objective is therefore set at 70% of the environment's carrying capacity, or approximately 210 individuals, which would reduce the risks of extinction following unexpected events. This objective may take 25 years to attain, given the population's present size and the possible reproductive rates of the Harbour Seal (DFO, 2009). This estimate of the habitat's carrying capacity, however, is uncertain and will be revised as new information becomes available. A population of 210 seals would remain very vulnerable in the face of potential environmental changes. COSEWIC might be able to change the status of the Lacs des Loups Marins Harbour Seal from endangered to threatened if the population numbers at least 250 mature individuals when the COSEWIC status report is updated.

The distribution objective of this strategy is to maintain the present range of the Lacs des Loups Marins Harbour Seal. The population and distribution objectives can be updated as new information on the seal and its habitat becomes available.

# 6. BROAD STRATEGIES AND GENERAL APPROACHES TO MEET OBJECTIVES

## 6.1 Recovery measures completed or underway

### 6.1.1 Tursujuq National Park

In July 2013, the Government of Quebec officially created the Tursujuq National Park. The territory of the park covers 15,549 km$^2$ on the east coast of Hudson Bay (Figure 2). The park includes Tasiujaq lake and Wiyâshâkimî lake (formerly called Guillaume-Deslisle and à l'Eau Claire), along with almost all of the Nastapoka River basin. The Kativik Regional Government has been a major partner in the development of the project and is in charge of managing park operations. According to the Government of Quebec, the primary objective of national parks is that "*exceptional natural sites and areas representative of Québec's natural landscapes are being handed down from generation to generation, while being developed for the benefit of all who wish to discover the abundance and diversity of nature.*" Hunting on park territory by park visitors remains prohibited, and aboriginal hunting rights as delineated in the James Bay and Northern Quebec Agreement are maintained. The population's entire critical habitat (Lacs des Loups Marins, Lake Bourdel and Petit lac des Loups Marins) is within the park boundaries. Park authorities say that the park will soon be the object of a conservation plan and that they will take care to adapt the level of protection (zoning) of certain areas for the conservation of this unique population. Highly sensitive areas within the park can be protected by specific zoning areas. In addition, an educational plan will facilitate and foster the exchange of information about this seal.

### 6.1.2 Research on Lacs des Loups Marins Harbour Seal Population

A few aerial surveys were conducted to gather more information on population size, the extent of the distribution range and the ecology of the Lacs des Loups Marins Harbour Seal. During the summer of 2010, Makivik Corporation, with the support of Fisheries and Oceans Canada and the help of local Cree and Inuit partners, carried out helicopter surveys to assess population numbers. In May 2011 and 2014, DFO carried out aerial surveys of the Lacs des Loups Marins. The park administration has produced a research plan, in collaboration with several local and regional partners (Government of Quebec, Centre for Northern Studies, Kativik Regional Government, Cree Regional Government, Avataq Cultural Institute, Nunavik Research Centre), to present all research priorities in Tursujuq National Park.

## 6.2 Strategic Direction for Recovery

To reach the population and distribution objectives, this recovery strategy presents several approaches and recovery measures (Table 2). They first aim to fill in knowledge

gaps on this population through scientific research but also by gathering traditional knowledge from the local communities. The approaches also aim to mitigate threats that could impact the population and to raise awareness in local communities of the Lacs des Loups Marins Harbour Seal's importance.

Proposed measures and strategies need to be implemented in collaboration with all local partners. This recovery strategy is an opportunity to create productive partnerships with regional Cree and Inuit authorities, the Kativik Regional Government (Tursujuq National Park) and the Quebec government. Local communities, and especially Cree and Inuit hunters, who know the territory and the seal well, will be major players and essential partners in the protection and recovery of this unique freshwater seal population.

Table 2: Recovery planning table
Note: in the table below, the name "seal" always refers to the Lacs des Loups Marins Harbour Seal.
**Priority level**: Low, would be useful to recovery; Moderate, is of significant interest for recovery; High, is indispensable for recovery.

| Approaches to recovery | Measures | Threats | Priority |
|---|---|---|---|
| 1. Improve our knowledge of the seal's ecology | 1.1. Develop and implement a research program on the life cycle (reproduction, birth, moult, etc.) and on species behaviour over time. | All | High |
| | 1.2. Compile traditional knowledge of the seal's ecology and behaviour. | | |
| | 1.3. Improve knowledge about seal predators. | | |
| 2. Evaluate the size, distribution and composition of the population | 2.1. Evaluate the genetic variability and isolation of the seal population. | All | High |
| | 2.2. Develop a survey method adequate for each population segment. | | |
| | 2.3. Compile traditional ecological knowledge in order to estimate population size. | | |
| | 2.4. Survey seal population with the help of local communities and the Kativik Regional Government via the Tursujuq National Park. | | |
| 3. Protect seal habitat | 3.1. Implement appropriate protection measures and zoning within Tursujuq National Park. | All | Moderate |
| | 3.2. Consider possible protective measures for potential seal habitat outside the park boundaries. | | |
| 4. Monitor the subsistence harvesting of the seal population | 4.1. Provide the communities with the means (sampling program, questionnaires, etc.) to track and evaluate the harvest. | Harvest | Moderate |
| | 4.2. Raise awareness of the hunters concerned to ensure good communication and facilitate good data collection. | | |
| | 4.3. Evaluate the possibility of introducing other conservation measures in collaboration with local | | |

| Approaches to recovery | Measures | Threats | Priority |
|---|---|---|---|
| | communities | | |
| 5. Minimize the impact of anthropogenic disturbance associated with the development of the tourism industry | 5.1. Study the behaviour of the seals when faced with anthropogenic disturbance at different moments in their life cycle. | Tourism | Moderate |
| | 5.2. Encourage the Tursujuq National Park's authorities to implement new management measures or modify existing ones to reduce disturbances due to tourism. | | |
| | 5.3. Encourage the Tursujuq National Park's authorities to inform, and increase the awareness of, visitors about the seal and its habitat to encourage them to take appropriate precautions in the areas the seal is known to inhabit. | | |
| 6. Develop and implement a strategic communication plan to increase public awareness of the unique character and importance of this seal subspecies | 6.1. Identify partners and target clientele. | All | Moderate |
| | 6.2. Secure the participation and collaboration of the Cree and Inuit. | | |
| | 6.3. Develop the educational tools to inform people about the seal and the threats it faces, while minimizing disturbance. | | |
| | 6.4. Involve local communities in collecting information on the population. | | |
| 7. Evaluate the impact of climate change on the survival and recovery of seals | 7.1. Evaluate increases in predators such as the black bear. | Climate change | Moderate |
| | 7.2. Assess seal habitat alterations caused by climate change. | | |
| | 7.3. Assess the impact of climate change on diseases and parasites. | | |
| 8. Limit disturbance by industrial activities | 8.1. Ensure that freshwater seals are considered in environmental impact assessments of mining projects. | Mining exploration and development | Low |

# 7. CRITICAL HABITAT

## 7.1 Identification of the Species' Critical Habitat

The *Species at Risk Act* stipulates that a recovery strategy must include *"an identification of the species' critical habitat, to the extent possible, based on the best available information…and examples of activities that are likely to result in its destruction"* (s. 41(1)(*c*)). This identification is designed to facilitate the protection of the critical habitat of the Lacs des Loups Marins Harbour Seal from human activities that can destroy it and compromise the survival and recovery of the species.

Critical habitat is defined in the *Species at Risk Act* (2002) section 2(1) as:

> *"the habitat that is necessary for the survival or recovery of a listed wildlife species and that is identified as the species' critical habitat in the recovery strategy or in an action plan for the species."* [s. 2(1)]

SARA defines habitat for aquatic species as:

> *"spawning grounds and nursery, rearing, food supply, migration and any other areas on which aquatic species depend directly or indirectly in order to carry out their life processes, or areas where aquatic species formerly occurred and have the potential to be reintroduced."* [s. 2(1)]

For the Lacs des Loups Marins Harbour Seal, critical habitat is identified to the extent possible, using the best available information. It includes the Lacs des Loups Marins, Lake Bourdel and Petit lac des Loups Marins (Figure 3). Seals spend all their lives in the lakes. These support all their vital functions: feeding, hauling out, reproduction, whelping, growth and migration. There is little scientific information on critical habitat features and their attributes. However, the presence of open water areas year-round is essential for breathing, hauling out and access to water and prey. A sufficient abundance of prey is also essential for the seals' survival. The schedule of studies in section 7.2 below outlines the activities required to obtain better knowledge of this habitat's features and attributes and to identify additional critical habitat necessary to support the population and distribution objectives.

### 7.1.1 Information and Methods Used to Identify Critical Habitat

All available information on this population's critical habitat was reviewed during the scientific assessment of the Lacs des Loups Marins Harbour Seal's recovery potential (DFO, 2009). This assessment was based on all available information on this species. Despite obvious knowledge gaps, scientists were able to determine the crucial elements for identifying critical habitat for this small population.

The Nastapoka River and Lacs des Loups Marins watershed is spread out over a vast territory that covers 16,600 km². The seals appear to be gathered in one particular section of approximately 500 km² formed by the Lacs des Loups Marins. They have also recently been observed in Lake Bourdel and the Petit lac des Loups Marins (Smith et al., 2006; F. Martin, Makivik, unpublished data). It is not known if the seals are found exclusively in this area because the population is so small or because this is the only viable area available to them. The first explanation seems to be the most plausible, considering that local traditional knowledge indicated the presence of these seals in the past in several other areas more or less adjacent to the Lacs des Loups Marins (DFO, 2009).

### 7.1.2 Description of Critical Habitat

According to the recovery potential assessment (DFO, 2009), the Lacs des Loups Marins, with a surface area of approximately 500 $km^2$, could provide habitat for 200 individuals. The preservation of a population of this size would reduce extinction risks from stochastic events. However, this population remains small and therefore is more vulnerable than a larger population to expected environmental changes owing to global warming.

Because it is a very small population, Fisheries and Oceans Canada prefers to consider the entire present range of this population and thus include Lake Bourdel and Petit lac des Loups Marins, near the Lacs des Loups Marins, in the identification of critical habitat. Critical habitat for the Lacs des Loups Marins Harbour Seal identified in this recovery strategy includes the Lacs des Loups Marins, Lake Bourdel and Petit lac des Loups Marins (Figure 3). Should these three lakes present similar productivity, the carrying capacity of this habitat, with a surface area of approximately 750 $km^2$, could provide for the survival of 300 seals. This critical habitat could therefore be sufficient to support the population objective of 210 freshwater seals, which corresponds to 70% of the habitat's total carrying capacity. These are areas that Fisheries and Oceans Canada considers to be of high quality, or potentially high quality, for the species. However, if the population is found in a greater area than that covered by the lakes identified as critical habitat, this identification may be insufficient and will have to be updated.

Identified critical habitat supports all functions necessary to the freshwater seal's life cycle because it spends all its life in these lakes. Reproduction, whelping, nursing and rearing of the young, growth, hauling out, feeding and migrations all occur within critical habitat. The only known features of critical habitat are the presence of permanent open water areas and sufficient prey abundance (Table 3).

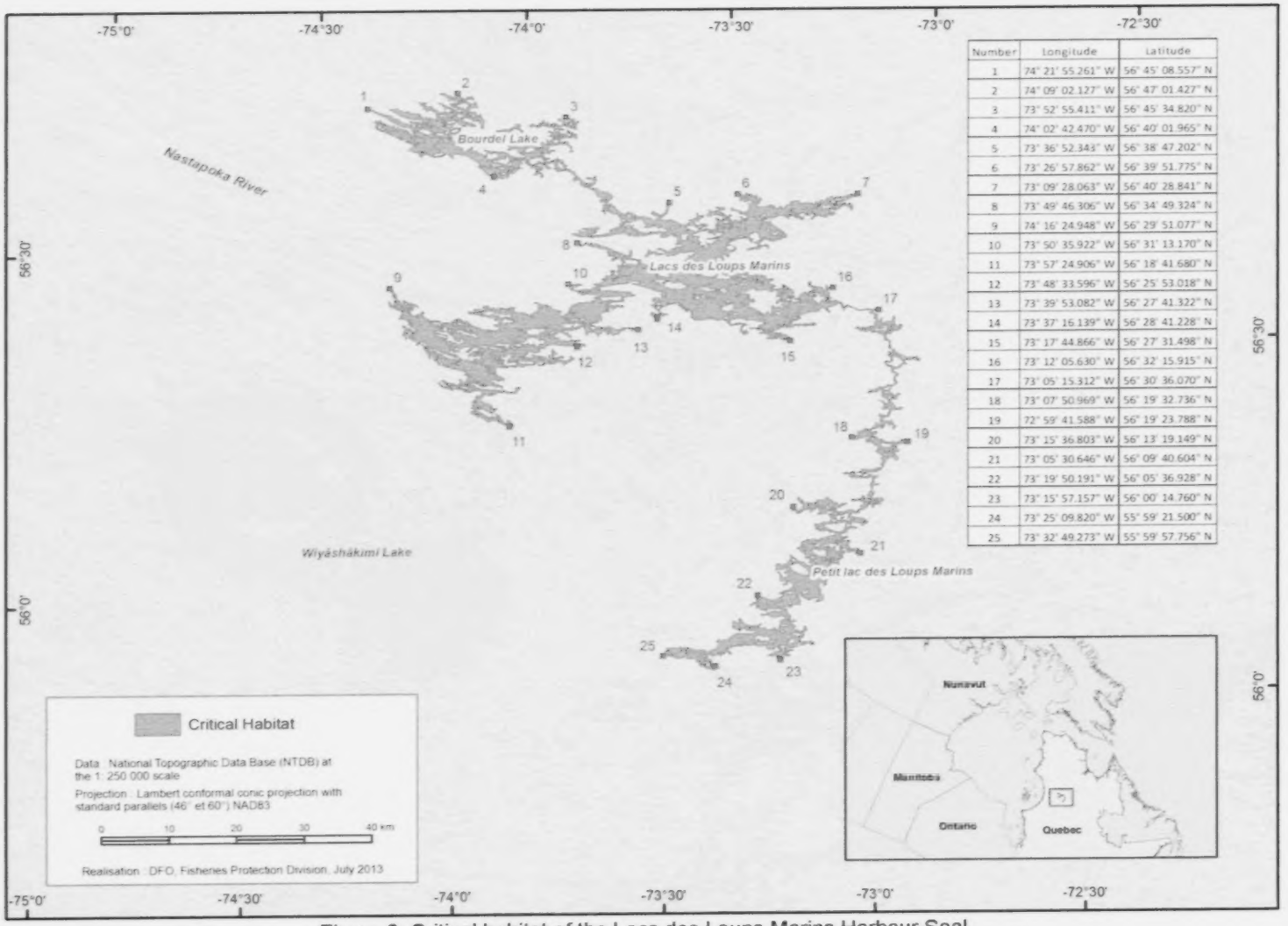
Unlike other Arctic seals such as the ringed seal and the bearded seal, the Harbour Seal is incapable of digging breathing holes in the ice during the winter. It thus depends on the presence of open water areas formed by rapids or water flow and on air pockets which form under the ice along the shoreline as water levels subside during the winter. Access to these open water areas, in order to breathe, haul out and to access the

aquatic habitat, is an essential feature of the Lacs des Loups Marins Harbour Seal's critical habitat.

Availability, abundance and quality of prey will affect the carrying capacity of the identified critical habitat, i.e. the ability of a recovered seal population to feed. Sufficient quality food resources are an attribute of critical habitat. The abundance and specific composition of the three lakes' fish is presently unknown.

Table 3: Summary of features and attributes of critical habitat

| Function | Location | Feature | Attributes |
|---|---|---|---|
| Reproduction, whelping, nursing, rearing, growth, hauling out, feeding and migrations | Lake Bourdel<br>Lacs des Loups Marins<br>Petit lac des Loups Marins | Open water areas | Sufficient number of permanent areas in winter (open water) |
| | | | Adequate size |
| | | | Adequate location |
| | | Prey | Available in sufficient abundance and quality |




| Number | Longitude | Latitude |
|---|---|---|
| 1 | 74° 21' 55.261" W | 56° 45' 08.557" N |
| 2 | 74° 09' 02.127" W | 56° 47' 01.427" N |
| 3 | 73° 52' 55.411" W | 56° 45' 34.820" N |
| 4 | 74° 02' 42.470" W | 56° 40' 01.965" N |
| 5 | 73° 36' 52.343" W | 56° 38' 47.202" N |
| 6 | 73° 26' 57.862" W | 56° 39' 51.775" N |
| 7 | 73° 09' 28.063" W | 56° 40' 28.841" N |
| 8 | 73° 49' 46.306" W | 56° 34' 49.324" N |
| 9 | 74° 16' 24.948" W | 56° 29' 51.077" N |
| 10 | 73° 50' 35.922" W | 56° 31' 13.170" N |
| 11 | 73° 57' 24.906" W | 56° 18' 41.680" N |
| 12 | 73° 48' 33.596" W | 56° 25' 53.018" N |
| 13 | 73° 39' 53.082" W | 56° 27' 41.322" N |
| 14 | 73° 37' 16.139" W | 56° 28' 41.228" N |
| 15 | 73° 17' 44.866" W | 56° 27' 31.498" N |
| 16 | 73° 12' 05.630" W | 56° 32' 15.915" N |
| 17 | 73° 05' 15.312" W | 56° 30' 36.070" N |
| 18 | 73° 07' 50.969" W | 56° 19' 32.736" N |
| 19 | 72° 59' 41.588" W | 56° 19' 23.788" N |
| 20 | 73° 15' 36.803" W | 56° 13' 19.149" N |
| 21 | 73° 05' 30.646" W | 56° 09' 40.604" N |
| 22 | 73° 19' 50.191" W | 56° 05' 36.928" N |
| 23 | 73° 15' 57.157" W | 56° 00' 14.760" N |
| 24 | 73° 25' 09.820" W | 55° 59' 21.500" N |
| 25 | 73° 32' 49.273" W | 55° 59' 57.756" N |

Figure 3: Critical habitat of the Lacs des Loups Marins Harbour Seal

## 7.2 Schedule of Studies to Identify Critical Habitat

Information on the distribution range, population size and habitat features of the Lacs des Loups Marins Harbour Seal remains very limited. The population objective in this recovery strategy is based on visual and telemetric observations mostly done in the Lacs des Loups Marins, and on a study on the lakes' productivity completed in the late 1970s (Power and Grégoire, 1978). Consequently, research is still required to improve knowledge about the distribution of this population, particularly on the density and abundance of seals in the lakes identified as critical habitat. These lakes' carrying capacity should also be assessed to validate the identified critical habitat and the population objective. A better understanding is required of its features and the functions it supports. For example, a better estimate of the availability of open water areas within the critical habitat should be carried out.

Table 4: Schedule of Studies

| Description of Activities | Results/Justification | Deadline |
|---|---|---|
| Identify and describe the present distribution range | Geographical distribution of the density and abundance of the Lacs des Loups Marins Harbour Seal, with a priority for the identified critical habitat. Surrounding lakes and rivers should also be assessed to validate critical habitat boundaries. | 5 years |
| Define the habitat requirements of the species at each period of its life cycle | Knowledge of critical habitat's features used by seals. Knowledge of features and functions of the habitat necessary for the survival or recovery of the Lacs des Loups Marins Harbour Seal. Particular attention should be given to permanent open water areas within critical habitat and in the surrounding lakes and rivers. | 5 years |
| Determine the habitat's carrying capacity | To provide information on the habitat surface area and fish density required to reach population recovery objectives. | 5 years |

## 7.3 Activities Likely to Destroy Critical Habitat

Any activity that modifies the attributes, presented in Table 5, of the different features of the identified critical habitat may lead to its destruction. Since habitat use varies over time, each human activity must be assessed separately, and specific mitigation measures must be implemented when they are effective and available. The list of activities presented in the table below is incomplete. The absence of a given human activity from the list does not prevent or hamper the department's ability to regulate it under SARA. In addition, the inclusion of an activity on the list does not automatically entail its prohibition, since it is the destruction of the critical habitat that is prohibited rather than the activity.

Under SARA, critical habitat must be legally protected within 180 days of being identified in a recovery strategy or action plan. For the Lacs des Loups Marins Harbour Seal critical habitat, it is anticipated that this will be accomplished through a SARA Critical Habitat Order made under subsections 58(4) and (5), which will invoke the prohibition in subsection 58(1) against the destruction of the identified critical habitat.

Any activity likely to modify water flow dynamics and consequently ice-formation patterns in the winter can result in the destruction of the critical habitat of Lacs des Loups Marins Harbour Seal. The seals may then have difficulty finding areas where they can surface for air, whelp or rest, not to mention the effects that changes to the environment's physical condition may have on the fish which constitute the seals' prey. Although the availability of prey is a feature of critical habitat, no human activity, such as fishing, seems likely now or in a near future to result in the destruction of critical habitat. According to information obtained by aboriginal hunters, these remote and inaccessible areas do not really suffer fishing pressure.

Table 5: Examples of activities likely to result in the destruction critical habitat

| Activity | Pathway of effect | Function affected | Feature affected | Attribute affected |
|---|---|---|---|---|
| Construction of dams and creation of reservoirs | Modification of water flow dynamics and ice-formation patterns in the winter | Reproduction, whelping, nursing, rearing, growth, hauling out, feeding and migrations | Open water area | Sufficient number of permanent areas in winter |
| | | | | Adequate size |
| | | | | Adequate location |

# 8. MEASURING PROGRESS

The performance indicators presented below are meant to provide the means to define and measure the progress being made towards reaching the distribution and population objectives. Progress in specific areas of the recovery strategy implementation will be assessed according to indicators outlined in future action plans.

Periodic assessment of the following abundance and recruitment indicators will measure the progress made towards the recovery of the population. These indicators could be:

- an increase in the number of seals observed
- an increase in population size estimates
- an increase in the number of pups surveyed (recruitment) or of the reproduction rate
- maintaining the species' distribution area

Indirect indicators such as the specific composition of fish communities and the abundance of fish in the lakes may be used to assess the size of the seal population and its distribution.

# 9. EXCEPTIONS

Harvesting rights in the territory covered by the James Bay and Northern Quebec Agreement (JBNQA) are set out in the Agreement, and the exercise of these rights takes into account principles of conservation that are intended to prevent wildlife from declining or disappearing. Subsection 83(3) of SARA exempts persons "*engaging in activities in accordance with conservation measures for wildlife species under a land claims agreement*" from the SARA prohibitions.

As stated in the article 24.3.30 of the JBNQA, "A minimum of control or regulations shall be applied to the Native people," with a minimum of impact on the Native people and harvesting activities. The population of seals in the Lacs des Loups Marins are found in areas where the Hunting, Fishing and Trapping Regime applies and, according to the Agreement, this seal population is reserved for the exclusive use of the Native people.

The Potential Biological Removal approach can be used to assess the number of seals that can be hunted without affecting survival of the population. This approach is a very cautious way to estimate an acceptable level of harvest when little information is available on population abundance, tendencies and dynamics, as in the case of the Lacs des Loups Marins Harbour Seal. Using this approach, with a population number of 50 individuals, which is the lowest abundance estimate, the allowable harm would be one seal every three years (DFO 2009). It should be noted that the actual population size is greater than the lowest estimate because in May 2011, 52 hauled-out seals were observed during a non-systematic survey of open water areas in the Lacs des Loups Marins (J.-F. Gosselin, DFO, personal communication).

Traditional Aboriginal knowledge suggests that a maximum of one seal per year is captured by Cree hunters. Cree elders estimate that between 1979 and 2009, there were fewer than 10 Lacs des Loups Marins Harbour Seals harvested by hunters (I. Masty, CTA, personal communication). Hunting of freshwater seals by Cree and Inuit hunters is occasional and opportunistic. The way it is presently carried out, the harvest does not seem to hinder the survival or recovery of the Lacs des Loups Marins Harbour Seal.

Based on all of this information, pursuant to the section 24.3.30 of the JBQNA and the *Marine Mammal Regulations* made under the *Fisheries Act*, the Minister of Fisheries and Oceans, as the representative of the federal government under the JBQNA, will communicate guidelines to the Hunting, Fishing and Trapping Coordinating Committee (HFTCC) about conservation measures.

These guidelines will mention that the harvest should be kept to its present level, which does not seem to hinder the survival or recovery of the population. To monitor the hunt, it is recommended that hunters report to local authorities information such as the location of the harvest as well as the length and sex of the harvested seal, and provide skin and jaw samples. The participation and collaboration of Cree and Inuit organisations and of the local communities are essential to obtain this information. Local administrations are in the best position to promote and implement these measures.

After an initial five-year period, new survey data and scientific analyses will help to re-evaluate more precisely the level of allowable harm for this population.

## 10. STATEMENT ON ACTION PLANS

One or more action plans will be completed within 5 years of the final posting of the recovery strategy.

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# APPENDIX A: EFFECTS ON THE ENVIRONMENT AND OTHER SPECIES

A strategic environmental assessment (SEA) is conducted on all SARA recovery planning documents, in accordance with the Cabinet Directive on the Environmental Assessment of Policy, Plan and Program Proposals. The purpose of a SEA is to incorporate environmental considerations into the development of public policies, plans, and program proposals to support environmentally sound decision-making and to evaluate whether the outcomes of a recovery planning document could affect any component of the environment or any goals and targets of the Federal Sustainable Development Strategy[6].

Recovery planning is intended to benefit species at risk and biodiversity in general. However, it is recognized that strategies may also inadvertently lead to environmental effects beyond the intended benefits. The planning process based on national guidelines directly incorporates consideration of all environmental effects, especially possible impacts on non-targeted species or habitats. The results of the SEA are incorporated directly into the strategy itself, but are also summarized below in this statement.

Protection of the Lacs des Loups Marins Harbour Seal habitat should benefit other species living in this area, such as the ichthyological community. Putting in place measures to reduce anthropogenic disturbances will also favour species likely to modify their behaviour with increased human presence.

[6] www.ec.gc.ca/dd-sd/default.asp?lang=En&n=F93CD795-1

# APPENDIX B: RECORD OF COOPERATION AND CONSULTATION

## Members of the Lacs des Loups Marins Harbour Seal Recovery Team

| | |
|---|---|
| Marthe Bérubé | Fisheries and Oceans Canada |
| Anne-Marie Bouchard | Ministère des Forêts, de la Faune et des Parcs du Québec |
| Mélanie Chabot | Kativik Regional Government (Tursujuq National Park) |
| Adamie Delisle-Alaku | Makivik Corporation |
| Andréanne Demers | Fisheries and Oceans Canada |
| Gregor Gilbert | Makivik Corporation |
| Caroline Girard | Fisheries and Oceans Canada |
| Jean-François Gosselin | Fisheries and Oceans Canada |
| Isaac Masty | Cree Trappers Association |
| Véronique Nadeau | Kativik Regional Government (Tursujuq National Park) |
| Stas Olpinski | Makivik Corporation |
| Allen Penn | Grand Council of the Crees |
| Catherine Pinard | Kativik Regional Government (Tursujuq National Park) |
| Nadia Saganash | Grand Council of the Crees |
| Alexandre Beauchemin | Hydro-Québec[7] |

## Consultations with Aboriginal communities

In collaboration with Cree and Inuit representatives, Fisheries and Oceans Canada held consultations with local Aboriginal communities to get their opinion on the protection and recovery of the Lacs des Loups Marins Harbour Seal under the *Species at Risk Act*, and to collect preliminary information on Aboriginal traditional knowledge.

Consultation meetings on adding the Lacs des Loups Marins Harbour Seal to the List of Wildlife Species at Risk were held in the Umiujaq, Kuujjuarapik and Whapmagoostui communities from December 16, 2008 to March 31, 2009. These meetings included municipal authorities, local stakeholders, hunters, the Hunters and Trappers Association as well as citizens.

The preliminary recovery strategy was also presented to Whapmagoostui and Umiujaq elders and hunters during a meeting on April 3, 2012. A meeting was also held on April 4, 2012 in Umiujaq with community members, including the mayor and several representatives from the Hunters and Trappers Association, to discuss the freshwater seal and hear their opinions.

[7] present up to June 2011.